

**BY ORDER OF THE COMMANDER
EDWARDS AIR FORCE BASE**

**EDWARD AIR FORCE BASE INSTRUCTION
21-105**



17 AUGUST 2012

Maintenance

***FOREIGN OBJECT DAMAGE (FOD)
PREVENTION AND DROPPED OBJECT
PROGRAMS***

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction implements the provisions of AFI 21-101 and AFI 21-101 AFMC SUP 1. It establishes policies and procedures for effective FOD prevention and Dropped Object Programs (DOP). This instruction is applicable to all operational and maintenance activities on Edwards Air Force Base (AFB). Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with AFMAN 33-363, *Management of Records*, and disposed of in accordance with the Air Force Records Disposition Schedule (RDS) located at <https://www.my.af.mil/afirms/afirms/afirms/rimc.cfm>. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF IMT 847, *Recommendation for Change of Publication*; route AF IMT 847s from the field through the appropriate functional's chain of command. This publication may be supplemented at any level, but all direct Supplements must be routed to the OPR of this publication for coordination prior to certification and approval. This publication does not apply to Air Force Reserve Command (AFRC) Units. No waiver may be granted for any part of this publication.

SUMMARY OF CHANGES

This instruction has been revised in content and is in compliance with recently changed Air Force policies and procedures. Added references to AFI 21-101 and AFI 21-101 AFMC Sup 1, *Aircraft and Equipment Maintenance Management*. This document has been extensively rewritten and requires a complete review.

1. General: Positive results can be gained through an aggressive and functional FOD prevention program emphasizing personal responsibility, good work practices, preventive measures and FOD program awareness, by all military, civilian and contract personnel taking an active part in all aspects of FOD control. The American Federation of Government Employees (AFGE), Local 1406, has been and shall continue to be actively involved in all aspects of this FOD Prevention Program. In addition, this OI provides a management tool to aid in the prevention and local reporting procedures for all DOP incidents.

2. Terms Explained

2.1. Foreign Object (FO): Substance or article alien to its surrounding area that could cause damage to aircraft or associated equipment. Major concerns are: chunks of asphalt, pieces of reflective paint striping, stones, pieces of concrete, loose pieces of sealant, etc.

2.2. Foreign Object Damage (FOD): Damage to an aircraft or equipment caused by the introduction of FO.

2.3. Dropped Object (DO): Any aircraft part, component, surface or other item that is lost during aircrew operations commencing from engine start to engine shutdown, unless intentionally jettisoned.

3. Policies

3.1. Program Responsibility: A 7-level technical sergeant or above, or civilian manager equivalent, will be appointed as the EAFB FOD Program Monitor and is responsible for directing and managing the FOD program in accordance with AF and AFMC policies and instructions.

3.2. FOD Prevention Committee: Will be comprised of representatives from organizations having a direct responsibility for flight line use and chaired by the 412 TW/CV. If the 412 TW/CV is not available, the committee will be co-chaired by the 412th Operations Group Commander (412 OG/CC) and the 412th Maintenance Group Commander (412 MXG/CC). At a minimum, Flight & Ground Safety (SE), 95th Air Base Wing Civil Engineer Division (95 ABW/CE), 95th Security Forces Squadron (95 SFS), 412th Operations Support Squadron (412 OSS), 412th Maintenance Group Quality Assurance (412 MXG/MXQ) and AFGE Local 1406, will appoint members to this committee. At a minimum, meetings will be held quarterly. Attendance is mandatory for each member or its designee.

4. Procedures

4.1. The FOD Prevention Program Manager will:

4.1.1. Ensure the FOD Program Monitor briefs the DOP at FOD Prevention Committee meetings.

4.1.2. Ensure the FOD Program Monitor gets involved in any Open House FO collection plans and briefs senior leadership on cleanup operations.

4.2. The 412 OG/CC will:

4.2.1. Ensure 412 OSS Airfield Management is represented at the FOD Prevention Committee meetings and briefs on pertinent airfield related matters.

4.2.2. Ensure Airfield Management closely monitors flight line related construction.

4.2.3. Ensure temporary flight line vehicle passes are signed verifying drivers have been briefed on flight line FOD prevention.

4.3. Unit Commanders, Directors and/or Division Chiefs having direct responsibility for flight line use will:

4.3.1. Appoint unit FOD Prevention monitors in writing, by forwarding a memo to the EAFB FOD Prevention Monitor.

4.4. Unit FOD Prevention Monitors will conduct bi-weekly (every two weeks) FOD inspections and report their findings and corrective actions to the area supervisor. Monitors will also oversee their respective areas and report all FOD incidents or mishaps, including minor nicks and blemishes on jet engine blades, to the 412th Maintenance Operations Center (MOC) and the EAFB FOD Prevention Program Monitor, (661) 277-3410, DSN 527-3410.

4.4.1. The Unit FOD Prevention Monitors and other committee members will represent their unit leadership's FOD issues at committee meetings and bring back and disseminate to the organization any FOD prevention information provided.

4.4.2. Unit FOD monitors will be responsible for maintaining continuity books for their sections. The books will contain current letters of appointment for the following individuals: the 412 Test Wing FOD Prevention Program Monitor and the unit's FOD Prevention Program Monitor. In addition, the books will contain a current copy of EAFBI 21-105, *Foreign Object Damage (FOD) Prevention Program*, a copy of the latest Quarterly FOD Prevention Committee Meeting minutes, a copy of the latest monthly FOD meeting minutes (if monthly meetings are held), the 412 MXG/MXQ Self Inspection checklist (SICL-10), the current Logistics Compliance Assessment Program (LCAP) checklist plus any other information pertinent to their particular areas of responsibility.

4.4.3. Unit FOD monitors will ensure that FOD awareness is promoted by the use of visual aids (posters, pictures, etc.) posted throughout their areas of responsibility.

4.5. The 412th Maintenance Squadron (412 MXS) Director will:

4.5.1. Ensure 412 MXS Nondestructive Inspection Laboratory furnishes the EAFB FOD Monitor or 412 MXG/MXQ with a completed checklist of all aircraft x-rayed for FOD-related reasons as they occur.

4.5.2. Ensure 412 MXS Wheel/Tire/Tow Target Section furnishes the EAFB FOD Monitor or 412 MXG/MXQ with a report on all tires damaged due to FO, as they occur.

4.6. All organizations with flightline access will:

4.6.1. Ensure vehicle operators accomplish a complete FO tire check upon entry onto the flight line. If the inspection is accomplished by the driver, the vehicle will be turned off and placed in park or lowest gear with brakes set to prevent vehicle movement. When inspecting tires, ensure a "roll-over check" is completed to ensure the entire surface is inspected for FO including the unseen area in contact with the pavement. Any vehicle leaving the paved surface while on the flight line must reaccomplish the FO check upon reentry (NOTE: vehicles responding to a flight line emergency are exempt from the tire FO check requirement). During towing operations, the maintenance crew must perform an FO inspection of the intended parking spot prior to moving the aircraft into position.

4.6.2. Ensure all vehicles normally driven on the flight line are equipped with an FO container with a lid (a pouch with a lid or flap for special-purpose vehicles, e.g., tugs, tow vehicles, etc.) with "FOD" stenciled in contrasting colored letters not smaller than two inches. Vehicle operators will empty the FO containers daily at the end of each work shift if used.

4.6.3. Ensure fire extinguishers that are carried on or mounted to vehicles have safety chains or cables attached to the extinguisher's safety pins to prevent FOD.

4.6.4. Ensure the MOC is notified immediately upon discovery of any damage to aircraft or equipment caused by FO to include bird strikes. The MOC will notify the 412 MXG Command Section, 412 OG/CC and 412 MXG/MXQ. The 412 MXG/MXQ will determine if it is a FOD incident and if further action is needed.

4.6.4.1. In addition to the reporting procedures outlined in AFI 21-101 paragraph 14.19.9, the FOD prevention monitor will also notify the following offices whenever a FOD incident occurs: 412 TW/CV, 412 MXG/CC, 412 MXG/CD and Flight Safety office.

4.6.5. Ensure aircraft or equipment involved in a FOD incident is investigated by 412 MXG/MXQ for possible impoundment.

4.6.6. Ensure that when any item is lost that a Red "X" is placed in the aircraft or equipment forms and applicable MDC system of all affected aircraft or equipment with a description of the tool/item and a specific, last known, location of the tool/item. The MOC and 412 MXG/MXQ will be immediately notified when this occurs. If the item is not found within an hour, an AFMC Form 310, **Lost Tool/Item Report**, will be initiated and submitted to 412 MXG/MXQ and the MOC. The 412 MXG/MXQ will issue a control number upon receipt of the AFMC Form 310. After the investigation, work centers and a 412 MXG/MXQ representative will present the completed AFMC Form 310 to the 412 MXG/CC or designee for signature and release. Refer to TW OI 21-200 for proper procedures for clearing lost tool/item reports. 412 MXG/MXQ will retain the completed AFMC Form 310 on file.

4.7. Base contracting office will:

4.7.1. Ensure the contractual requirements for FOD prevention are adhered to for the contracts it administers.

4.8. FOD prevention practices and guidelines:

4.8.1. Personal items such as wigs, hair fasteners (except rubber bands), earrings and all other jewelry are not authorized on the flight line (flight line is defined as "any area or facility, including aprons, hardstands and ramps on or in which aircraft may be parked, stored, serviced or maintained," reference AFOSH STD 91-100) or in any other areas where aircraft related component or support equipment maintenance is performed, e.g., back-shops, AGE, work stations, support sections, etc. Note: This requirement does not apply to the administrative portions of those facilities listed above where maintenance is not performed.

4.8.2. Ear protectors or communication headsets are the only headgear authorized for wear while working on or within danger zones of aircraft with operating engines. Hats or other headgear will not be worn within 25 feet of operating aircraft engines.

4.8.3. Restricted area and identification badges will be secured to each individual utilizing line badge lanyards or a plastic armband to prevent loss and possible FOD. Badges will be removed when performing intake and exhaust inspections or within 25 feet of an operating jet engine.

4.8.4. When using armband line badge holders, the elastic material and plastic covering must be in good repair, with no tears or fraying.

4.8.5. Training monitors or the Unit FOD Prevention Monitor of each organization will provide FOD prevention training as required for all their assigned personnel.

4.8.6. Any time a lakebed landing has occurred or Compass Rose area is used, the following inspections will be conducted at a minimum, with a red dash (-) placed in the AFTO Form 781A:

4.8.6.1. Tires for cuts and damage.

4.8.6.2. Wheel wells, landing gear struts and lower areas of aircraft for damage.

4.8.7. Building custodians will monitor facility areas for items that could be a potential FOD hazard and establish controls to ensure personnel use trash bags and secure all trash in dumpsters. If an accumulation of trash exceeds the dumpster capacity, note the location of the dumpster and call 95 ABW/CEO Service Contracts at (661) 277-2431 to request immediate emptying or repairs. Trash overflowing from dumpsters will be bagged and stored in a safe location out of the wind until the dumpsters are emptied.

4.8.8. FOD walks will be accomplished prior to the start of the day's flying period (the flying period at Edwards AFB begins prior to the first flight of the day and ends after the last scheduled aircraft lands) by all available physically capable personnel (regardless of grade or status) engaged in aircraft maintenance where alternate FO abatement procedures have not been employed (i.e. FOD Boss, etc.). FOD walk areas of responsibility and time intervals will be determined according to ramp use by 412 MXG Maintenance Supervision (see attachment for schedule and areas of responsibility). All aircraft operating areas are to be inspected and made free of FO up to the adjacent taxiways. Flight line sweepers may be called for through the MOC to clean areas as needed.

4.8.9. FOD collection containers will be maintained and used in their respective areas and emptied as required. Obtaining FO containers used in vehicles is the responsibility of the organization using and operating the vehicles. Fuel bowsers will not be used for FO or trash disposal.

4.8.10. There will be no eating or drinking in areas where any maintenance is being performed (back shops, hangars or the flight line) except for capped water bottles or containers. Vehicles may dispense beverages contained in paper or foam cups. Additionally, the use of personal hydration packs (water containers worn as a back pack) may be used if authorized by supervision. All personnel will be responsible for preventing damage to equipment as a result of taking hydration packs or water bottles

onto the flight line. All other consumption will be limited to authorized break areas only and all personnel will be responsible for properly disposing of their personal trash.

4.8.11. Personnel entering aircraft cockpits will ensure that personal belongings are properly secured to prevent FOD. Before climbing into the cockpits of fighter or trainer-type aircraft, all open pockets must be emptied, unless pockets can be sealed, zipped or otherwise closed to prevent items from falling out.

4.8.12. When a person enters an engine intake, pocket-less coveralls with no buttons (pockets may be sewn shut) and shoe covers will be worn. NOTE: All items will be removed from shirt and trouser pockets prior to donning coveralls and shoe covers. Coveralls will be marked "FOR INTAKE AND EXHAUST INSPECTION ONLY".

4.8.13. All auxiliary air intake openings near or adjacent to aircraft intakes, engine inlets, vari-ramps (when applicable), auxiliary power units and gas turbine units will be covered when maintenance is in progress in or around these areas.

4.8.13.1. Plug or cap all openings, ports, lines, hoses, electrical connections and ducts on aircraft, engines, munitions, missiles, drones, space systems, support equipment, AGE, trainers or components to prevent FO from entering these systems any time maintenance is not being performed (i.e., end of task, end of shift) and IAW applicable technical data.

4.8.14. All intake and inlet and pitot covers will be installed and secured to the aircraft as soon as possible after flight or maintenance.

4.8.15. Engine inlet plugs and covers will remain installed until 15 minutes prior to crew show for fighter and trainer aircraft. Heavy aircraft plugs and covers may be removed up to 2 hours prior to aircrew arrival. If the plugs and covers are removed from any aircraft and the flight is delayed, the plugs and covers will be reinstalled accordingly.

4.8.16. After flight, the intake covers or plugs must be installed once engine maintenance inspections are completed. **Note:** In the interest of safety, if inlet covers are not installed on large aircraft prior to winds reaching gusts of 25 knots, squadron maintenance supervision may delay the installation of covers until wind speed drops below 25 knots.

4.8.17. Intake covers or plugs removed for ground test/maintenance runs, may remain removed as long as testing or maintenance is being conducted. For large aircraft, the covers and plugs do not need to be reinstalled when maintenance has to stop for short periods of time, such as lunch, breaks, bench stock runs, etc. Required maintenance must be properly documented to show it is in work. When work is complete or stopped for the day, the covers or plugs must be installed.

4.8.18. All aircraft -21 equipment and covers will be marked with the correct aircraft serial number on which they are to be installed.

4.8.19. Aircraft engine ring cowls found with loose rivets will be removed from service until repaired in accordance with applicable technical orders.

4.8.20. All parts and hardware (fasteners, screws, clamps, etc.) removed during on- and off-equipment maintenance will be bagged and tagged with the number of items removed and the aircraft or equipment serial number. Consolidated Tool Kits (CTK) will not be used to store loose hardware. Any hardware temporarily stored in a CTK during

completion of an ongoing task will be stored in a screw bag or sealed container and removed prior to turn-in.

4.8.21. Cleanliness of maintenance and manufacturing areas will be maintained at all times. Keep areas free of FO. A thorough cleanup will be accomplished upon completion of each task and at the end of the shift. Also, a thorough CTK and FO search will be accomplished prior to engine start, launch or movement of any aircraft.

4.8.22. Blade blend blue dye will be controlled as HAZMAT in accordance with AFFTCI 32-19. Only authorized personnel, identified in writing by the work-center supervision, will be allowed to check out and use the blue dye.

5. FOD Awards Program

5.1. The intent of this program is to increase FO, DO and Lost Tool awareness and reward outstanding contributions by AFFTC personnel for their efforts in FOD/DO and Lost Tool prevention.

5.2. The 412 TW/CV, 412 OG/CC, 412 MXG/CC or their designated representative will present the awards.

5.3. The following list outlines the FOD Awards:

5.3.1. Golden Washer Award: 412 MXG/MXQ will conduct four random housekeeping inspections per month in accordance with the established and published QA Plan for all units. The unit that demonstrates the best housekeeping and FOD prevention practices will be selected as the quarterly winner. The total number of passed housekeeping inspections will be the criteria used to determine this award. The award is a certificate presented to the unit that achieves this.

5.3.2. Golden Bolt Award: A 4-inch gold colored bolt with a red aircraft streamer attached, will be placed on the aircraft parking ramp, inside of a vehicle or in a maintenance area that will be monitored by the EAFB FOD Program Monitor or alternate. The individual who finds the item and turns it over to the FOD Program Monitor is the winner. This will be done quarterly. The awards presented will be: a Certificate of Recognition signed by the 412 TW/CV, 412 OG/CC, or the 412 MXG/CC and a 412 TW FOD Prevention Coin. In addition, military members will receive a 1-day pass. Civilian Time-Off Awards may also be earned when justification meets or exceeds guidelines established in AFI 36-1004 Chapter 3. If selected, contractor personnel will be awarded Certificates of Recognition and a coin.

5.3.3. FOD Poster of the Quarter: Posters depicting FOD messages are submitted through the EAFB FOD Program Monitor. When posters are provided, a winner will be selected and honored at the quarterly meetings. Posters must be submitted to the EAFB FOD Program Monitor assigned to 412 MXG/MXQ located in Building 1600, no later than 5 days before the quarterly meeting. The winning poster will be displayed inside the FOD display case in Building 1600. The awards presented will be: a Certificate of Recognition signed by the 412 TW/CV, 412 OG/CC, or the 412 MXG/CC and a 412 TW FOD Prevention Coin. Additionally, military members will receive a 1-day pass. Civilian Time-Off Awards may also be earned when justification meets or exceeds

guidelines established in AFI 36-1004 Chapter 3. If selected, contractor personnel will be awarded Certificates of Recognition and a coin.

5.3.4. FOD Fighter of the Month: This award recognizes FOD awareness through outstanding contribution to the AFFTC FOD Prevention Program. The EAFB FOD Program Monitor selects this winner from supervisory input. An individual must demonstrate an outstanding act of FOD prevention to be submitted for this award. The individuals selected as monthly winners will be automatically entered into the annual FOD Fighter of the Year contest. Submit all entries to the EAFB FOD Program Monitor at the 412 MXG/MXQ office no later than the first duty day of the month. The awards presented will be: a Certificate of Recognition signed by the 412 TW/CV, 412 OG/CC, or the 412 MXG/CC and a 412 TW FOD Prevention Coin. Additionally, military members will receive a 1-day pass. Civilian Time-Off Awards may also be earned when justification meets or exceeds guidelines established in AFI 36-1004, Chapter 3. If selected, contractor personnel will be awarded Certificates of Recognition and a coin.

5.3.5. FOD Fighter of the Year: Selected annually by the EAFB FOD Program Monitor from previous monthly winners and based on importance of FOD fighting effort. The awards presented will be: a Certificate of Recognition signed by the 412 TW/CV, 412 OG/CC, or the 412 MXG/CC and a 412 TW FOD Prevention Coin. Additionally, military members will receive a 1-day pass. Civilian Time-Off Awards may also be earned when justification meets or exceeds guidelines established in AFI 36-1004, Chapter 3. If selected, contractor personnel will be awarded Certificates of Recognition and a coin.

6. Dropped Object Program

6.1. A 7-level technical sergeant or above, or civilian manager equivalent will be appointed as the 412 TW DOP monitor and is responsible for directing and managing the DOP in accordance with AF and AFMC policies and instructions.

6.2. Immediately upon discovery of a suspected dropped object, the ground crew will notify the expediter/production supervisor of the incident. Expediters/production supervisors will be the POCs for all DOP incidents.

6.3. The expediter/production supervisor will notify Quality Assurance (412 MXG/MXQ), the MOC and squadron supervision of the dropped object incident and will initiate a DOP work sheet. The work sheet can be found on SharePoint/412Maintenance Group/412 Quality Assurance/QA information Site/FOD Program Info. If any assistance is needed in locating the work sheet, contact the Wing FOD/DOP monitor or the 412 MXG/MXQ office.

6.4. The MOC will notify the 95 Edwards AFB Command Post of the incident and base operations/airfield maintenance for a runway and taxiway check if warranted.

6.5. The owning organization of DOP-involved aircraft will investigate loss for cause and prevention.

6.6. Upon completion of the DOP work sheet, maintenance supervision will electronically forward the report to the 412 MXG/MXQ office (412 MXQ Workflow mail box) and to the MOC (412 MXG/MXFO mail box).

6.7. The wing DOP monitor will in turn notify and forward a preliminary report to HQ AFMC/A4M, 95 ABW/CP, AFFTC/SEF, 412 TW/CV, 412 MXG/CC and 412 MXG/CD.

6.8. The wing DOP monitor or 412 MXG/MXQ office will validate the owning organization's investigation determining the probable cause and actions to prevent incident re-occurrence. When material or design deficiency is the cause or suspected cause, a Deficiency Report will be initiated by the aircraft-owning organization, even when an exhibit is not available, through the 412 MXG/MXQ Product Improvement office (7-2015).

6.9. When the investigation is completed, the wing DOP monitor will submit a final report to AFMC/A4M, Edwards AFB Command Post, Safety office, 412 TW/CV, 412 MXG/CC and 412 MXG/CD and the initiating unit's supervision no later than three duty days after the occurrence.

6.10. The wing DOP monitor will file the original report and update the DOP database.

GREGORY E. SCHWAB, Colonel, USAF
Installation Commander

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

AFI 21-101, *Maintenance Management of Aircraft*, 26 July 2010

AFI 65-601 Vol 1, *Budget Guidance and Procedures*, 3 March 2005

AFI 91-203, *Air Force Consolidated Occupational Safety Instruction*

TW OI 21-200, *Tool and Equipment Control and Accountability Program*, 22 December 2009

AFI 36-1004, *Managing the Civilian Recognition Program*, 3 December 2009

Adopted Forms

AF Form 310, *Lost Tool/Item Report*

AF Form 847, *Recommendation for Change of Publication*

Attachment 2

FOD BOSS USE AT EDWARDS AFB

A2.1. FOD Bosses will be used to supplement not take the place of FOD walks (AFI 21-101 Par.14.19.2.12)

A2.2. FOD Boss use/ FOD walks will be conducted as outlined on page two of this amendment. All FOD preventive measures will be accomplished first thing in the morning or as necessary.

A2.3. See next page for areas of responsibility/schedule

A2.4. Equipment owning organizations will be responsible for:

- Equipment maintenance in accordance with the owner's manual
- Equipment storage
- Equipment management (CACRL)
- Towing and personnel
- Equipment clean-up after each use or at the end of the duty day.

A2.5. Inspections/documentation/requirements

An AFTO form 244 will be used for each FOD boss and the following inspections will be documented

- Prior to use

- Perform a 90 day visual inspection for serviceability, hardware security, and/or tears.

A2.6. Vehicle operators will meet all requirements for driving on the flight line

Attachment 3

AREAS OF RESPONSIBILITY/ SCHEDULE

Figure A3.1. Areas of Responsibility/Schedule

SQUADRON	SCHEDULE
<u>412 MXS/412 MXIS/412 FLTS</u> (when on station)	Ramp 1, spots A-H Mon, Tue, Thu, Fri: FOD Boss Wednesday: FOD Walk Wash Rack Tuesday, Thursday: FOD walk
<u>412 AMXS</u> MXAR (Raptor) MXAJ (Lightning)	 Ramp 11 Ramp 8
<u>912 AMXS</u> MXAA (Shadow) MXAC (Heavies) MXAD (Falcon) MXAB (Bombers)	 Ramp 1, Spots O-R, Ramp 2, Pad 29 Ramp 6 Ramp 7 Ramps utilized on South Base Mon-Wed-Fri FOD Boss Tue – Thu FOD walks Policing up (prior to and after use) of all areas not specifically addressed above will be the responsibility of the user. Units are also responsible for areas in or around their facilities.

Figure A3.2. 412 MXS, 412 MXG, 412 AMXS/MXAA, 412 FLTS

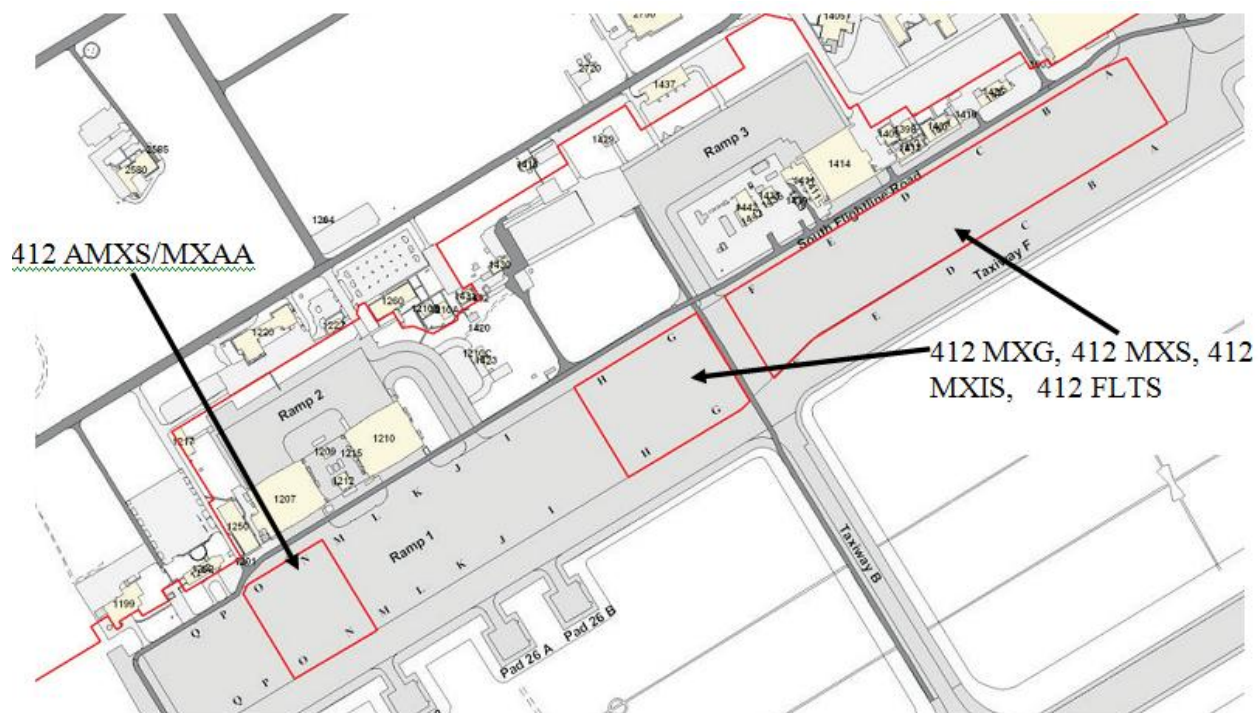
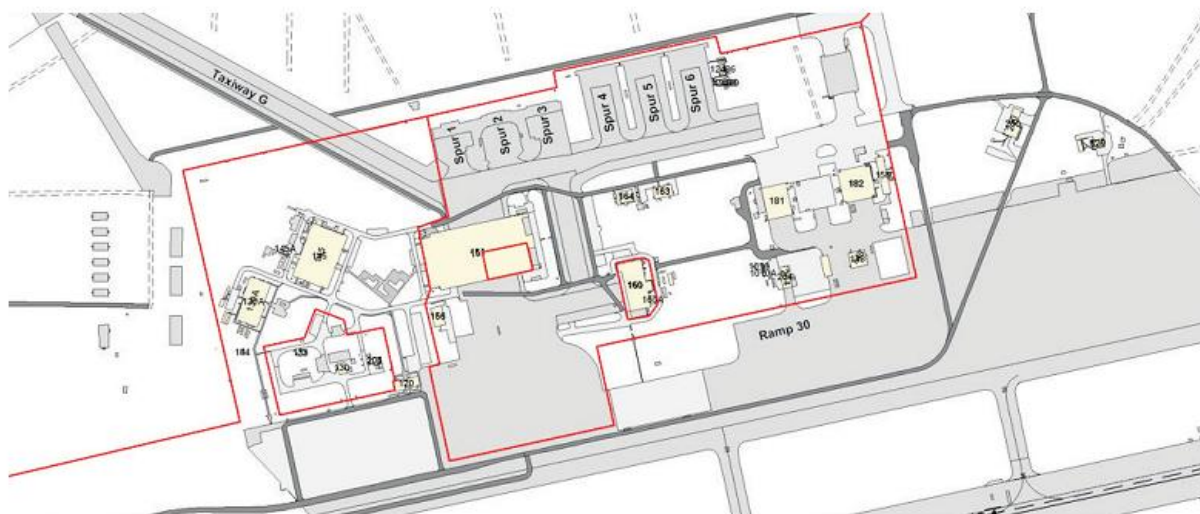
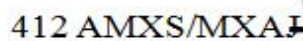


Figure A3.3. 912 AMXS/MXAB



412 AMXS/MXAR



912 AMXS/MXAD

912 AMXS/MXAG

